

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property  
Organization  
International Bureau



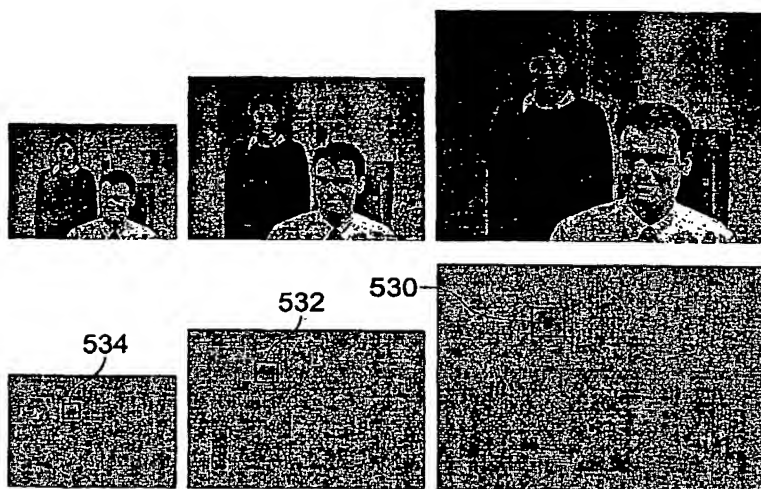
(43) International Publication Date  
17 June 2004 (17.06.2004)

PCT

(10) International Publication Number  
**WO 2004/051553 A3**

- (51) International Patent Classification<sup>7</sup>: **G06K 9/00** [MR/GB]; 216 Southway, Guildford, Surrey GU2 8DN (GB).
- (21) International Application Number: PCT/GB2003/005236 (74) Agents: **TURNER, James, Arthur et al.**; D Young & Co, 21 New Fetter Lane, London EC4A 1DA (GB).
- (22) International Filing Date: 28 November 2003 (28.11.2003) (81) Designated States (*national*): JP, US.
- (25) Filing Language: English (84) Designated States (*regional*): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).
- (26) Publication Language: English
- (30) Priority Data: 0227913.1 29 November 2002 (29.11.2002) GB  
Published:  
— with international search report  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (71) Applicant (*for all designated States except US*): **SONY UNITED KINGDOM LIMITED** [GB/GB]; The Heights, Brooklands, Weybridge KT13 0XW (GB). (88) Date of publication of the international search report: 15 July 2004
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- (75) Inventors/Applicants (*for US only*): **PORTER, Robert, Mark, Stefan** [GB/GB]; 28 Western Road, Winchester, Hampshire SO22 5AJ (GB). **RAMBARUTH, Ratna** For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: FACE DETECTION



(57) Abstract: Face detection apparatus generating an output indicative of the likelihood of test regions of a test image containing a face comprises means operable to compare a test region with face data indicative of the presence of a face in such a way as to detect plural respective likelihood value indicative of the likelihood of the test region containing a face of a group of respective different face sizes; and control means, responsive to metadata associated with the image defining one of a set of predetermined classifications of the image, for modifying the group and/or the likelihood values in dependence upon a face size or range of face sizes appropriate to the classification of that image.

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## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

|   |   |  |
|---|---|--|
| Applicant's or agent's file reference<br><b>P015804WO</b> | <b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. |  |
| International application No.<br><b>PCT/GB 03/05236</b>   | International filing date (day/month/year)<br><b>28/11/2003</b>   | (Earliest) Priority Date (day/month/year)<br><b>29/11/2002</b> |
| Applicant<br><br><b>SONY UNITED KINGDOM LIMITED</b>       |   |  |

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

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☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

13a-c

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

T/GB 03/05236

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 G06K9/00

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 G06K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)  
EPO-Internal, INSPEC, COMPENDEX, IBM-TDB, PAJ, WPI Data**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| A          | <p>TAE-KYUN KIM ET AL: "Integrated approach of multiple face detection for video surveillance"<br/>PATTERN RECOGNITION, 2002. PROCEEDINGS. 16TH INTERNATIONAL CONFERENCE ON QUEBEC CITY, QUE., CANADA 11-15 AUG. 2002, LOS ALAMITOS, CA, USA, IEEE COMPUT. SOC, US, 11 August 2002 (2002-08-11), pages 394-397, XP010613903<br/>ISBN: 0-7695-1695-X<br/>page 395, left-hand column, paragraph 3</p> <p style="text-align: center;">-----<br/>-/--</p> | 1-16                  |

☒ Further documents are listed in the continuation of box C.☐ Patent family members are listed in annex.

## \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
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Date of the actual completion of the international search

24 May 2004

Date of mailing of the international search report

04/06/2004

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## INTERNATIONAL SEARCH REPORT

International Application No.

T/GB 03/05236

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|------------|--|-----------------------|
| A          | <p>GARCIA C ET AL: "Face detection using quantized skin color regions merging and wavelet packet analysis"<br/>IEEE TRANS. MULTIMED. (USA), IEEE TRANSACTIONS ON MULTIMEDIA, SEPT. 1999, IEEE, USA,<br/>vol. 1, no. 3. September 1999 (1999-09), pages 264-277. XP001191136<br/>ISSN: 1520-9210<br/>page 269, left-hand column, paragraph 2 - right-hand column, paragraph 1<br/>-----</p> | 1-16                  |
| A          | <p>HARDEBERG JON'Y: "Digital red eye removal"<br/>J IMAGING SCI TECHNOL; JOURNAL OF IMAGING SCIENCE AND TECHNOLOGY JULY/AUGUST 2002, vol. 46, no. 4, July 2002 (2002-07), pages 375-379, XP001189507<br/>page 378, left-hand column, paragraph 6<br/>-----</p>   | 1-16                  |